

Problem 3.47

Show that

$$x + \frac{2}{3}x^3 + \left(\frac{2}{3}\right)\left(\frac{4}{5}\right)x^5 + \left(\frac{2}{3}\right)\left(\frac{4}{5}\right)\left(\frac{6}{7}\right)x^7 + \cdots = \frac{\arcsin x}{\sqrt{1-x^2}}$$

(Putnam Exam 1948).

Clue: What differential equation does this Taylor series satisfy?